

IP-over-T1/E1 Gateway

TC3844-1

- **Fast Ethernet Transport over Framed & Unframed T1 or E1**
- **IEEE 801.p QoS with Four Queues**
- **Ethernet and T1/E1 Statistics Monitoring**
- **VLAN Tagging and Priority Labeling**
- **Manage Via Web, SNMP, Serial Console, Telnet**
- **Temperature & Power Consumption Monitoring**
- **Extreme Temp (-40°C to +80°C) Optional**
- **Meets or Exceeds IEC 61850-3, IEEE1613 & NEMA TS-2 Standards**
- **Member of the JumboSwitch® Product Family**



TC3844-1 - IP-over-T1/E1 Gateway

The TC3844-1 Ethernet-over-T1/E1 Gateway allows the user to extend Ethernet backhaul applications to remote locations over existing TDM Telecom infrastructure. It converts the Ethernet data into framed or unframed T1/E1 format for transmission over T1/E1 links, and the modules are used in pairs.

The TC3844-1 performs store-and-forward of frames with Ethernet traffic conditioning and bridging functions at wire speed, fully utilizing the TDM circuit. The internal bridge supports VLAN tagging and priority labeling which enables the user to define different QoS levels according to the application requirements.

A variety of important features are included such as fault management, auto-negotiation with flow control, Statistics Monitoring, Network Time Protocol, Remote Firmware Upgrade and Temperature and Power Monitoring.

In-band and out-of-band management are accessed via Web, SNMP, Console and Telnet. Diagnostic tools include LEDs, dry contact alarms and local and remote loop-back

The TC3844-1 interface card can fit into any available JumboSwitch housing option including 2S Standalone chassis and 1U/2U/4U card cages. Power Redundancy is standard and power supply options available for standalone version are 90-260VAC, 12VDC, 24VDC and -48VDC. Standard operating temperature is -20°C to +70°C and the extreme temperature version is -40°C to +80°C.

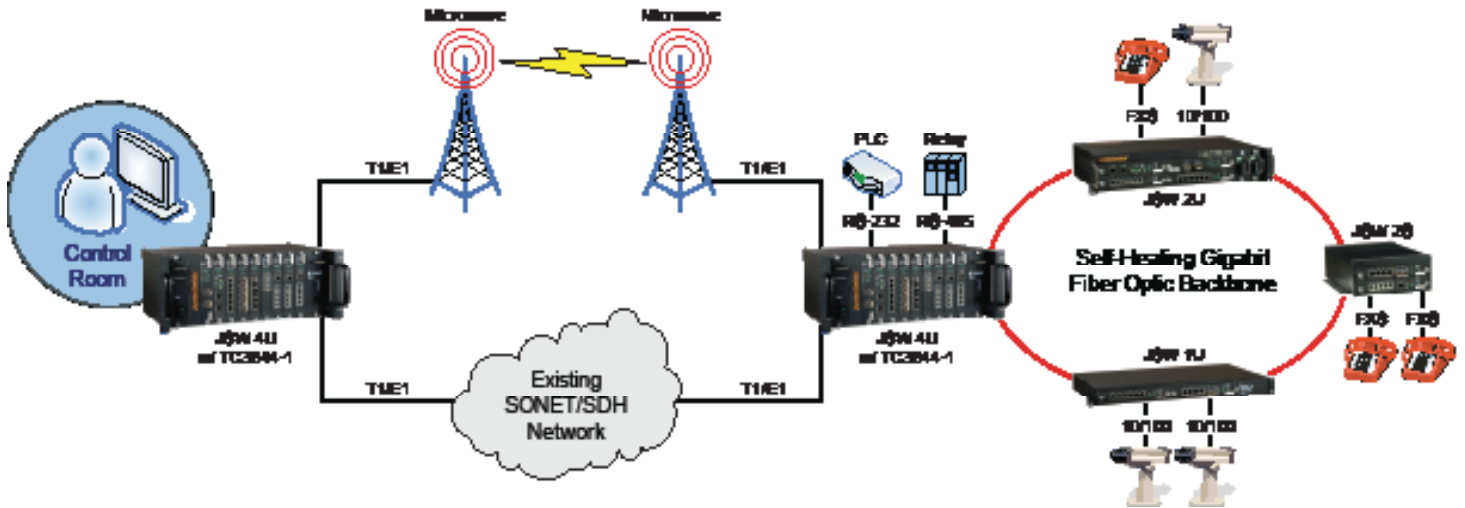
Applications

- Bridging Ethernet LANs over Existing T1/E1 Telecom Network
- Extending Ethernet Networks by Utilizing TDM Telecom Infrastructure (i.e. T1/E1 Landline, or T1/E1s/PDH/SDH Microwave Carrying T1/E1)
- Demarcation Between the Carrier's and Customer's Networks
- Bonded Transparent LAN Service

Environmental & EMI Compliance

The JumboSwitch product family meets all pertinent industry-specific standards for environmental, performance and security requirements including IEC 61850-3, IEEE 1613, NEMA TS-2 and NERC CIP. Furthermore, future JumboSwitch family products will continue to be compliant with both existing and emerging industry standards and requirements, including developing Ethernet standards. Please refer to the charts below for specific standards compliance information.

	Tests	Industrial Standards	TC Communications - JumboSwitch Type Test and Levels	
			Power Supply Unit (PSU)	RJ-45 & Signal
Temperature/Humidity	Low Temperature Use	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-1; Ae; -40°C; 16 hour	
	Low Temperature Storage	IEC 61850-3, IEEE 1613, NEMA TS-2		
	High Temperature Use	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-2; Be; +80°C; 16 hour	
	High Temperature Storage	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-2; Bd; +85°C; 16 hour	
	Damp Heat	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-30; Db; +55°C; 95%; 96 hours	
Mechanical	Vibration	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-6; Fc; 3 - 150 Hz; 7.5 mm; 2 g; 10 sweeps per axis	
	Shock	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-27; Ea; 30g; 11ms	
ElectroMagnetic Compatibility	Electrostatic Discharge Immunity	IEEE 1613	IEC 61000-4-2; 8kV contact; 15 kV air	
	Radiated RF Immunity	IEC 61850-3, IEEE 1613	IEC 61000-4-3; 80 MHz - 1000 MHz; 20 V/m; AM 80% 1 kHz	
	EFT/Burst Immunity	IEC 61850-3, IEEE 1613	IEC 61000-4-4; 4 kV CM	IEC 61000-4-4; 4 kV CM
	Surge Immunity	IEC 61850-3	IEC 61000-4-5; 4 kV LG; 2 kV LL	IEC 61000-4-5; 4 kV LG; 2 kV LL
	Conducted RF immunity	IEC 61850-3	IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz	IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz
	Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-8; 50 Hz; 100 A/m cont.; 1000 A/m 1 s	
	Damped Oscillatory Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-10; 100 kHz; 30 A/m	
	Damped Oscillatory Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-10; 1 MHz; 30 A/m	
Power Supply Unit (PSU) Variations	AC Voltage Dips	IEC 61850-3	IEC 61000-4-11; 30% & 100%, 0.5s	NA
	DC Voltage Dips	IEC 61850-3	IEC 61000-4-29; 40% & 70%, 0.1s	NA
	Damped Oscillatory Wave	IEC 61850-3	IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @1MHz	IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @ 1MHz
	Conducted PF CM Voltage	IEC 61850-3	IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s	IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s
	Conducted Emission	IEC 61850-3	CE/FCC/CISPR22 class A	CE/FCC/CISPR22 class A
	Conducted emission	IEC 61850-3	CE/FCC/CISPR22 class A	CE/FCC/CISPR22 class A
	Radiated emission	IEC 61850-3	CE/FCC/CISPR22 class A	
Dielectric	Dielectric 50 Hz Test	IEEE 1613	IEC 60255-5; 2 kV	IEC 60255-5; 0.5 kV
	Impulse Voltage Test	IEEE 1613	IEC60255-5; 5 kV	IEC 60255-5; 5 kV



Typical Application using TC3844-1 IP-over-T1/E1 Gateway

Electrical

T1 Interface

- Connector.....Electrical, RJ-48
- Line Termination..100Ω, balanced
- Data Rate.....1.544Mbps
- Line Code.....B8ZS AMI
- Framing: Unframed D4 ESF SLC-96
- Compliance..... ANSI T1.102,403 ITU-T G.703, 736, 823

E1 Interface

- Connector.....Electrical, RJ-48
- Line Termination:120Ω, balanced, 75Ω, unbalanced via RJ-48 to BNCadapter cable
- Data Rate.....2.048Mbps
- Line Code.....HDB3 AMI
- Framing.....Unframed FAS CRC-4 multiframe G.732 CA multiframe
- Compliance.....ITU-T G.703, 704, 736, 823.....

Ethernet Interface

- Connector.....Electrical, RJ-45
- Type.....10/100Base-T
- Compliance.....IEEE 802.3

System

- Bit Error Rate1 in 10⁹ or Better

Regulatory Approval

- CE, FCC Part 15, CISPR (EN55022)
- CLASS A, IEC 61850-3, IEEE 1613, NEMA TS-2

LEDs

- ALM, RLB, MGM, D (Duplex), L (Link), PWR A, PWR B, BP, LOS, B8ZS/HDB3/AMI, AIS, BPV

Power

- Standard.....12VDC
- Optional.....24, -48 VDC
-90-260 VAC, 50/60Hz
- Power Consumption.....<10W

Operating Temperature

- High Temp-20°C to 70°C
- Extreme Temp-40°C to 80°C

Storage

- Temperature.....-40°C to 90°C
- Humidity.....95% non-condensing

Physical (rack mount card)

- Height.....(3.15 cm) 1.24"
- Width.....(17.78 cm) 7.0"
- Depth.....(22.86 cm) 9.0"
- Weight.....(0.3kg)0.75lbs

Note - Information contained in this data sheet is subject to change without prior notice.



ISO 9001
QMI-SAI Global
#1045959

TC Communications, Inc.
17881 Cartwright Road
Irvine, CA 92614 U.S.A.
Factory Tel: (949) 852-1972
Fax: (949) 852-1948

Sales Office
U.S.A. Domestic International:
(800) 569-4736 (949) 852-1973

Web Site: www.tccomm.com
E-mail: sales@tccomm.com



www.JumboSwitch.com



DTS-38441-01-05
Rev. 022412